

Response Under 37 CFR 1.116

Expedited Procedure

Examining Group 2800

Application No. 10/528,953

Paper Dated October 3, 2006

In Reply to USPTO Correspondence of July 5, 2006

Attorney Docket No. 0115-050642

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claims 1-20 (Cancelled)

Claim 21 (Currently Amended): A connector for the detachable connection of at least one optical waveguide to at least one optoelectronic component which is arranged and electrically contacted as a chip on the surface of a support, and which has an optical axis perpendicular to the support, wherein:

the optical waveguide includes a fiber-optic plug connector; and

the connector includes a base part which is fastened on the surface of the support surrounding the optoelectronic component, whereby the base part only partially covers the surface of the support, and which has a through-hole for optical signals to be exchanged between the optoelectronic component and the optical waveguide and a coupling part which is exclusively mounted to the base part facing outward and which has an insertion opening for the insertion of the fiber-optic plug connector.

Claim 22 (Previously Presented): The connector of claim 21, wherein the base part comprises a plate which extends transversely to the direction of insertion of the fiber-optic plug, which can be connected on one side to the coupling part and which has on the other side an adapter with which the base part can be placed onto the support.

Claim 23 (Previously Presented): The connector of claim 22, wherein the fiber-optic plug connector includes:

a ferrule in which the optical waveguide ends; and

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a ferrule holder for receiving the ferrule when the plug connector is inserted on the base part, the ferrule holder provided on the side of the plate opposite the adapter, whereupon the through-hole opens out into the ferrule holder.

Claim 24 (Previously Presented): The connector of claim 23, wherein the ferrule holder protrudes into the coupling part.

Claim 25 (Previously Presented): The connector of claim 23, wherein the adapter and the ferrule holder are part of a one-piece insert which is inserted into the plate on the base part.

Claim 26 (Previously Presented): The connector of claim 25, wherein:
the insert is produced from metal, and
the plate is produced from plastic.

Claim 27 (Previously Presented): The connector of claim 25, wherein the insert and the plate are united in a one-piece element and produced from a plastic.

Claim 28 (Previously Presented): The connector of claim 25, wherein the through-hole is positioned inside the insert between the adapter and the ferrule holder.

Claim 29 (Previously Presented): The connector of claim 25, further including means for focusing light rays passing between the optoelectronic component and the optical waveguide arranged in the insert.

Claim 30 (Previously Presented): The connector of claim 29, wherein the focusing means includes a lens.

Claim 31 (Previously Presented): The connector of claim 30, wherein the lens is arranged at the entry of the drilled through-hole.

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Claim 32 (Previously Presented): The connector of claim 29, wherein the focusing means includes a focusing reflective surface.

Claim 33 (Previously Presented): The connector of claim 22, wherein:
the plate of the base part is arranged parallel to the support; and
the through-hole and the insertion opening run in the direction of the optical axis of the optoelectronic component.

Claim 34 (Previously Presented): The connector of claim 33, wherein the adapter is formed in a hollow-cylindrical manner.

Claim 35 (Previously Presented): The connector of claim 22, wherein:
the plate of the base part is arranged perpendicular to the support;
the through-hole and the insertion opening run parallel to the support; and
the connector further includes means for the orthogonal deflection of the light rays passing between the optoelectronic component and the optical waveguide in the adapter.

Claim 36 (Previously Presented): The connector of claim 35, wherein the deflecting means includes a hemispherical lens which simultaneously deflects and focuses the light rays.

Claim 37 (Previously Presented): The connector of claim 35, wherein the deflecting means includes a planar reflective surface.

Claim 38 (Previously Presented): The connector of claim 35, wherein the deflecting means includes a focusing reflective surface.

Claim 39 (Previously Presented): The connector of claim 21, wherein the optoelectronic component is a Vertical Surface Cavity Emitting Laser (VCSEL).

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Therefore, the receptacle of the Kyomasu patent can only be used for optoelectronic elements that are mounted in circular housings with an outer diameter less than the inner diameter of the mounting hole.

The DeAndrea patent discloses a connector for optically coupling a fiber optic transmission line and an optoelectronic device electrically coupled to a substrate. The connector includes a naked optoelectronic chip (30) mounted on a plane substrate (15). The connector further includes a first coupling part or light-bending means (150) mounted on the substrate (15) and surrounding the chip (30) as shown in FIG. 13. A second coupling part or casing (50) is also mounted on the substrate (15) surrounding the first coupling part (150).

A similar restriction of use as discussed hereinabove with regard to the Kyomasu patent applies to the connector disclosed in the DeAndrea patent. As is clearly illustrated in FIGS. 6, 7 and 12-14, the box-like casing (50) of the connector disclosed in the DeAndrea patent is adapted to be mounted to and substantially cover the top surface (17) of the substrate (15) (see column 9, lines 52-54). The substrate (15) supports electronic circuit components (16) and an optoelectronic device (30). Thus, the casing (50) and the substrate (15) have a form-fit where the substrate (15) is completely received by the casing (50). Therefore, special measures must be taken to keep the substrate (15) parallel to the light transmission axis. Furthermore, the contour and the lateral dimensions of the substrate (15) have to be carefully selected such that the substrate (15) tightly fits into the casing (50).

The present invention allows for a simpler and much more flexible solution by simply fastening a base part on the top surface of the support of the optoelectronic device without being restricted by the contour or lateral dimensions of the support. The base part only encloses the optoelectronic device. The remaining electronic circuitry mounted on the support may be outside of the base part thereby allowing even large area supports to be optically connected with the connector according to the present invention.

In summary, the Kyomasu patent does not teach or suggest that the base part only partially covers the surface of the support as required by amended independent claim 21. As is clearly illustrated in FIGS. 1B and 1C of the Kyomasu patent, the entire surface of the lid portion (10c), which supports the laser diode (50), is covered. Furthermore, the DeAndrea